

CAECA OF SOME INDIAN BIRDS.

BY

J. L. BHADURI and B. BISWAS,

(Zoology Department, University College of Science, Calcutta).

(With a text-figure.)

It is well known that colic caeca show great variability in form and size in birds, and they have been utilized in the systematic consideration of birds (Beddard¹). It has been noted by Newton² that mere presence or absence is no good criterion in taxonomy, but their state of development is of much importance; and that there exists certain correlation between the caeca and the length and width of the large intestine. Stuart Baker³ mentions the forms of caeca as characters for several major divisions. Besides, it is believed that there exists some relation between the state of development of caeca and the food habits of birds, at least in several groups of birds.

In course of our⁴ studies on the arterial arches of birds we examined the conditions of caeca and have kept records of their shape and size as also their site of origin in relation to the cloacal opening. In view of diverse shape and size of the caeca which could hardly be expressed in suitable descriptive terms, we have taken resort to faithful sketches of all the forms studied by us. The table below provides the measurements of length and width of caeca as also their sites of origin measured from the cloacal opening. Stuart Baker's (*op. cit.*) classification is adopted in the systematic arrangement of the species in the table, and we take this opportunity of recording our sincere thanks to Dr. S. C. Law, M.A., Ph.D., for the identification of birds.

We did only 52 different species belonging to 23 families in 7 orders, of which 35 species are provided with caeca and the rest (17 species) are without them. Great diversity is observed in Coraciiformes not only from the point of view of their presence or absence but also from their shapes and sizes. Viewed from the ventral side of the dissection of the bird, the caeca are in most

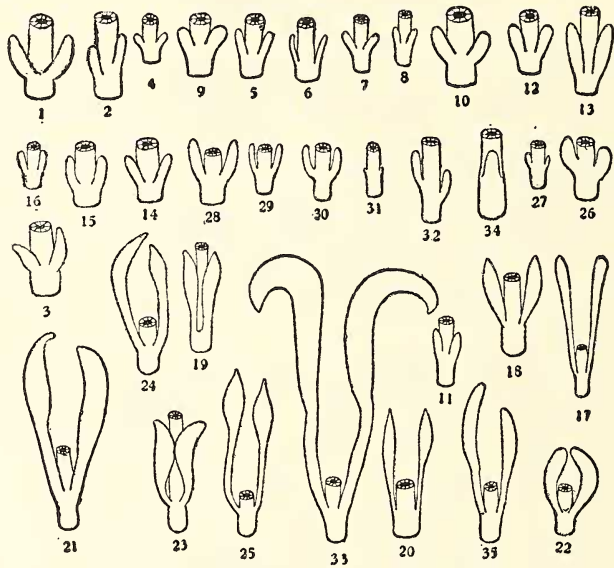
¹ Beddard, F. E. (1898), The Structure and Classification of Birds.

² Newton, A. (1896), A Dictionary of Birds.

³ Stuart Baker (1922-29), *Fauna of British India—Birds—I-VI*.

⁴ Bhaduri, J. L. & Biswas, B. (1945), 'The Cervical and Thoracic arteries of Birds', *Proc. Nat. Inst. Sci. India*, Vol. xi, No. 3, pp. 236-45.

cases lateral in origin as usually stated but ventro-lateral origins are not also wanting in practically all the groups. In some instances a pronounced asymmetry in the origins (Figs. 2, 26, 32) is observed, but we cannot vouch for its truth as we examined only one specimen each. An asymmetry in length of the two caeca is likewise observed in a few cases (Figs. 3, 21, 24, 25, 35). The free ends of the caeca are pointed in some cases, while the shorter caeca are generally blunt at tips. In long caeca the free ends are swollen and gradually tapering at ends excepting those of *Cuculus* (Fig. 17) where they are blunt at tips and distinctly club-shaped.



The origins of caeca measured from the cloacal openings are very varied in different families. Some families, like *Dicruridae*, *Cuculidae*, etc., show close approximation of measurements. These ought to indicate some close relationship in the members of the families, but more species need to be worked out before we can arrive at any conclusion.

Attempts have been made to correlate this structure with food habits of birds, but they proved abortive in a general way, although in some groups there are elements of truth of this fact. Our studies are too meagre at present to warrant any conclusion, but sufficient to suggest that further records in different species, comprehensive of genera and families, will be helpful not only in throwing light on the systematics of the group but also in evaluating the affinities running between them.

TABLE

Showing the measurements (*in millimetres*) of the caeca and their position in relation to the cloacal openings. (R = right; L = Left).

Name	No. of specimens	Maximum		Distance from cloacal opening	Fig. No.
		Length	Width		
PASSERIFORMES					
Corvidae					
<i>Corvus s. splendens</i> Vieillot	4	6.0	2.0	8.0—16.5	1
<i>Dendrocitta v. vagabunda</i> (Lath.) ...	1	4.5	1.0	R. 17.5 L. 20.0	2
Timaliidae					
<i>Turdoides somervillei terricolor</i> (Blyth) ...	1	4.0	2.0	14.0	3
<i>Aegithina t. tiphia</i> (L.) ...	1	1.5	0.75	10.0	4
Pycnonotidae					
<i>Molpastes cafer bengalensis</i> (Blyth) ...	2	3.5	1.0	5.0—9.0	5
<i>Otocompsa jocosa emeria</i> (L.)	1	4.0	0.5	21.0	6
Turdidae					
<i>Copsychus s. saularis</i> (L.)	1	3.0	1.25	12.75	7
Pericrocotidae					
<i>Pericrocotus p. peregrinus</i> (L.) ..	1	2.0	0.75	6.0	8
Artamidae					
<i>Artamus fuscus</i> Vieillot ...	1	3.25	2.0	23.0	9
Dicruridae					
<i>Dicrurus m. macrocerus</i> Vieillot ...	1	4.75	2.0	17.0	10
<i>Chibia h. hottentotta</i> (L.) ...	1	8.25	1.25	16.0	11
Sturnidae					
<i>Sturnia m. malabarica</i> (Gmel.) ...	1	4.0	1.5	11.0	12
<i>Acridotheres t. tristis</i> (L.)	1	7.0	2.0	11.5	13
<i>Acridotheres ginginianus</i> (Lath.) ...	1	4.0	1.0	10.0	14
<i>Sturnopastor c. contra</i> (L.)	4	4.0	1.25	7.0	15
Ploceidae					
<i>Ploceus p. philippinus</i> (L.)	3	2.5	1.0	8.0	16
CORACIIFORMES					
Picidae					
<i>Yungipicus nanus brunnei-ceps</i> Baker ...	1				
<i>Brachypternus b. benghalensis</i> (L.) ...	3				
Capitonidae					
<i>Thereiceryx zeylanicus caniceps</i> (Frankl.) ...	3			Absent	
<i>Cyanops a. asiatica</i> (Lath.)	5				
<i>Xantholaema haemacephala lutea</i> (Less.) ...	3				
Cuculidae					
<i>Cuculus m. micropterus</i> Gould ...	1	15.5	1.5	35.0	17
<i>Hierococcyx varius</i> Vahl ...	2	18.25	4.0	33.0—35.0	18
<i>Clamator j. jacobinus</i> (Bodd.) ...	1	21.5	3.75	36.0	19

TABLE I—(Continued)

Name	No. of specimens	Maximum		Distance from cloacal opening	Fig. No
		Length	Width		
CORACIIFORMES—cont.					
Cuculidae—cont.					
<i>Eudynamis s. scolopaceus</i> (L.) ...	2	27·0	3·0	33·0—32·0	20
<i>Centropus s. sinensis</i> (Stephen) ...	1	40·0	6·5	38·0	21
Psittacidae					
<i>Psittacula eupatria nipalensis</i> (Hodgs.) ...	1	}	Absent		
<i>Psittacula krameri manillensis</i> (Bechst.) ...	3				
<i>Psittacula c. cyanocephala</i> (L.) ...	2				
Coraciidae					
<i>Coracias b. benghalensis</i> (L.) ...	1	20·25	4·0	16·0	22
Meropidae					
<i>Merops o. orientalis</i> (Lath.)	2	11·25	2·25	9·0	23
Alcedinidae					
<i>Ramphalcyon capensis gural</i> (Pearson) ...	1	}	Absent		
<i>Halcyon s. smyrnensis</i> (L.)	3				
<i>Halcyon pileata</i> (Bodd.) ...	1				
<i>Halcyon smyrnensis fusca</i> (Bodd.) ...	3				
<i>Sauropatis c. chloris</i> (Bodd.)	2				
Upupidae					
<i>Upupa epops orientalis</i> Baker ...	3				
Asionidae					
<i>Otus bakkamoena marathae</i> Ticehurst ...	1	28·5	4·0	14·0	24
<i>Athene brama indica</i> (Frankl.) ...	3	36·5	5·25	14·0—17·0	25
ACCIPITRES					
Falconidae					
<i>Milvus migrans govinda</i> Sykes ...	1	4·75	2·0	R. 48·0	26
<i>Astur badius dussumieri</i> (Temm. and Laug.) ...	1	1·25	0·60	L. 47·0 16·5	27
COLUMBIFORMES					
Columbidae					
<i>Crocopus p. phoenicopterus</i> (Lath.) ...	1	}	Absent		
<i>Dendrophasa b. bicincta</i> (Jerd.) ...	1				
<i>Chalcophaps i. indica</i> (L.) ...	1				
<i>Columba livia intermedia</i> Strick. (Domestic) ...	5	5·0	1·5	19·0—20·0	28
<i>Streptopelia chinensis suratensis</i> (Gmel.) ...	2	3·5	0·75	15·0—17·0	29

TABLE I—(Continued)

Name	No. of specimens	Maximum		Distance from cloacal opening	Fig. No.
		Length	Width		
COLUMBIFORMES—cont.					
Columbidae—cont.					
<i>Streptopelia senegalensis cambayensis</i> (Gmel.) ...	1	3·0	1·0	25·0	30
<i>Streptopelia d. decaocto</i> (Frival.) ...	1	0·5	0·25	27·0	31
<i>Oenopelia t. tranquebarica</i> (Herm.) ...	1	3·5	1·0	R. 19·0 L. 17·5	32
GALLIFORMES					
Phasianidae					
<i>Gallus gallus murghi</i> Rob. and Kloss (Domestic) ...	1	102·0	8·25	47·0	33
HERODIONES					
Ardidae					
<i>Bubulcus ibis coromandus</i> (Bodd.)* ...	1	3·5	2·0	36·0	34
ANSERIFORMES					
Anatidae					
<i>Querquedula querquedula</i> (L.) ...	1	31·0	3·5	41·0	35

* Only one caecum is present.

FISHING CONTRIVANCES USED IN H.E.H. THE NIZAM'S DOMINIONS.

BY

S. MAHMOOD, M.SC., AND M. RAHIMULLAH, D.SC., F.Z.S.,

Department of Fisheries, Hyderabad (Deccan).

Hyderabad State contains 30,219 large tanks numerous smaller ones and 468.05 miles of canals besides many large and small rivers and irrigation reservoirs chief of which are Nizamsagar, Alisagar, Singtom reservoir (Nizamabad district), Osmansagar, Himayatsagar, Mir Alum tank and Hussainsagar (Hyderabad and suburbs), Pocharam lake (Medak district) Djindi and Pindlipakla reservoirs (Nalgonda district), Pakhal, Laknawaram, Ramappa lakes, Wyra and Palair reservoirs (Warangal districts), Rooti reservoir (Bhir district) Moyal Marchaid reservoir (Raichur district).

Most of the tanks are directly or indirectly fed by the rivers and canals and are thus stocked with fish during the rains. Fishes breed in the reservoirs, up the anicuts and in the rivers, and fish-fry are